REMARKS

The present amendment makes editorial changes and corrects typographical errors in the specification, which includes the Abstract, in order to conform the specification to the requirements of United States Patent Practice. No new matter is added thereby. Attached hereto is a Substitute Specification including a marked-up version of the changes made thereto via by the present amendment.

In addition, the present amendment cancels original claims 1-11 in favor of new claims 12-17. Claims 12-17 have been presented solely because the revisions by red-lining and underlining which would have been necessary in claims 1-11 in order to present those claims in accordance with preferred United States Patent Practice would have been too extensive, and thus would have been too burdensome. The present amendment is intended for clarification purposes only and not for substantial reasons related to patentability pursuant to 35 U.S.C. §§101, 102, 103 or 112. Indeed, the cancellation of claims 1-11 does not constitute an intent on the part of the Applicants to surrender any of the subject matter of claims 1-11.

Early consideration on the merits is respectfully requested.

Respectfully submitted,

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Marked-Up Version of Substitute Specification

SPECIFICATION

TITLE OF THE INVENTION

~~Description~~

~~LOCALISATION METHOD~~

LOCALIZATION METHOD

~~Field of the Invention~~

FIELD OF TECHNOLOGY

This ~~invention~~application relates to a ~~localisation~~localization method used in connection with emergency calls in mobile communications systems.

~~Background of the Invention~~

BACKGROUND

The demand for security is rapidly growing and thus advanced technology in communications, safety, and security systems is mandatory in order to maintain, track and respond to alarm signals. A wide variety of emergency call systems ~~has~~have been used, including direct connected, i.e. hard wired systems, wireless systems, and telephone systems.

If an emergency call is made, ~~furthermore a localisation~~localization of the communication device and its respective user is desirable. ~~Within~~Under current communications ~~systems~~systems, various methods for determining a position are known, such as using the cell identification (cell ID), or ~~localisation~~localization methods within a cell, ~~e.g.~~such as E-OTD (Enhanced Observed Time Difference).

However, to make use of emergency call systems ~~with localisation~~using localization methods, it is necessary to be connected to the respective cellular network. In other words, no emergency call can be made if no network is available.

~~Disclosure of the Invention~~

BRIEF SUMMARY

Based on the ~~foregoing description it is an object of the invention to provide~~text blow, a method, ~~an~~ apparatus and a system is disclosed for safely making an emergency call, regardless of the respective cellular network connection.

~~The object of the invention will be achieved with a method, a communication device and a system which are characterised by what is disclosed in the appended independent claims. Advantageous embodiments of the present invention will be presented in the dependent claims.~~

The ~~invention~~present disclosure is based on the idea of selecting one network out of a plurality of possibly available ~~networks~~networks, and sending an emergency signal over the selected network. According to ~~preferred embodiments of the invention~~an exemplary embodiment, one of these communications networks may be an emergency location transmitter (ELT) network, ~~e.g.~~such as an airborne or other safety network. According to another ~~or the same preferred~~exemplary ~~embodiment~~embodiment, ~~of the invention~~ one of ~~these~~the communication networks may be a cellular, e.g. a mobile phone, network. Such a safety network may exist independently from any cellular communications network.

~~Thus, upon~~Upon activating an emergency call routine at a communication device, a module for broadcasting over the safety network can be enabled, if a cellular network is not available.

~~By broadcasting we understand a transmitting~~The broadcast would preferably transmit to all stations in the range of the communication device.

~~Now two cases are to be distinguished~~

~~1) A cellular network is available:~~

In cases where a cellular network is available,~~In this case a~~ an emergency call procedure is performed by using the cellular network. Additional services, e.g. a more accurate ~~localisation~~localization, can be requested optionally from a suitable instance of the safety network, e.g. a a safety control centre.

~~2) No cellular network is available~~

In cases where no cellular network is available, ~~In this case a~~an emergency call procedure is performed by using ~~an~~ a safety network.

~~Brief description of the drawings~~

BRIEF DESCRIPTION OF THE DRAWINGS

~~In the following, the invention will be described by means of preferred embodiments with reference to the accompanying drawing, in which:~~

The various objects, advantages and novel features of the present disclosure will be more readily apprehended from the following Detailed Description when read in conjunction with the enclosed drawings, in which

Figure 1 is an exemplary embodiment of an apparatus aligned to make emergency calls by pushing only one ~~button,~~button;

Figure 2 ~~shows~~illustrates a schematic block diagram concerning the relations between user, network providers and safety control ~~centres~~centers in the case of public sponsorship of the emergency ~~number,~~ number; and

Figure 3 ~~shows~~illustrates a ~~similar~~ diagram for private and public sponsorship.

~~Detailed description of the invention~~

DETAILED DESCRIPTION

Reference is now made to Figure 1. In this ~~preferred embodiment~~embodiment, the underlying idea is that help can be reached by just pushing ~~one~~a single button (1) in a communication device ~~that is widespread~~, e.g. a mobile phone or cell phone or any other mobile communication device. ~~Hence~~It is understood that the communication device ~~may be not~~is not limited only ~~a~~to cell ~~phone~~phones, but ~~also~~to any other kind of mobile equipment allowing to establish a connection to a cellular communications network.

The button 1 initiates an emergency call routine, by which an emergency call is performed using ~~or utilising~~ a network that is determined by the routine. ~~Thus~~Accordingly, a world-wide safety system would be available by using a cell phone, even if there is no cellular communications network such as GSM (Global System for Mobile Communications) available. This concept complies with the risen safety awareness anywhere in the world. Wide availability can be achieved by using cell phones or generally mobile equipment which are low cost widespread communication devices.

~~By~~In the exemplary embodiment, the cellular (communications) network ~~we refer~~refers to any network such as GSM (Global System for Mobile Communications), TDMA/CDMA (Time Division Multiple Access / Code Division

Multiple Access) based networks, UMTS (Universal Telecommunications System), WLAN (Wireless Local Area Network)-Systems.

The concept makes use of an emergency or global safety network, e.g. an airborne network comprising satellites and/or aircraft. This will be described below in detail:

Typical safety networks may exist independently from any cellular network and ~~are based on e.g.~~include airborne objects and/or satellites and/or radio beacons. As ~~the beacons,~~beacons that can be operated as a transponder and/or a ~~transmitter,~~transmitter can be mobile, ~~we refer to them~~they are referred to as a network with mobile transmitter stations or an emergency network in the framework of the application. The mobile beacons can be ~~placed e.g. on~~implemented from places such as a aircraft or on a vessel.

~~In the following some more details are given about safety networks:~~ By law, all civil and military aircraft carry an emergency location transmitter (ELT) on board. The ELT begins transmitting when it is activated by the gravitational forces caused by an aircraft crash. When another aircraft or satellite receives an emergency ~~signal~~signal, it transfers information about the crash location to the respective air search and rescue ~~centres~~centers. ~~More generally spoken~~Generally, the aircrafts and satellites are able to receive signals from emergency radio beacons and relay them to ground stations, which, in turn, process the signal to determine where the beacon is located. The ground stations then relay this information to search and rescue authorities. The system typically has four parts: emergency radio beacons, which call for help; aircrafts and satellites to receive said calls; ground stations, which get the message; and control ~~centres~~centers, which sound the alarm.

The emergency radio beacon has two functions: first, if somebody is in distress in a remote ~~area~~area, ~~he~~he/she can make an emergency call ~~and secondly~~. Secondly, by doing ~~so also~~so, information is also provided about ~~his~~his/her location. There are three kinds of radio beacons, classified by who uses them. Aircrafts normally have an emergency location transmitter (ELT). At sea, the vessel should have an emergency position indicating radio beacon (EPIRB). Personal location beacons (PLB) are for land activities such as hiking or camping in the

wilderness. The radio beacons can transmit signals on certain emergency frequencies normally located in (but not limited to) the VHF (Very High Frequency) region between a hundred and a few hundred MHz. Every signal of a beacon can be detected by airborne objects or satellites or can be repeated by another beacon, e.g. carried by aircraft passing by, which is then functioning as a transponder.

~~To sum up~~In other words, since the emergency network is ~~used~~available for communication, identification and ~~localisation. Therefor,~~localization, the proven ELT (Emergency Location Transmitter) technology principle ~~is~~may be used. By identification of a communication device or its respective ~~user~~user, the identification can be based on the telephone number, the IMEI (International Mobile Equipment Identity) ~~etc.~~, or other means.

In the context of the application by airborne ~~network~~network, not only a network provided by the satellites is covered, but also a network based upon the satellites in combination with transponders or transmitters placed in aircrafts or vessels.

An ELT activator suitable for a communication device may ~~consist of~~include a detector ~~sensible~~susceptible to gravitational forces, ~~sensible to~~ smoke, ~~sensible to~~ pressure, temperature or various other environmental parameters. Apart from environmental ~~parameters~~parameters, the ELT activator may also detect certain personal parameters, by which conclusions about the person's health state can be made.

~~Now an exemplary method is described to perform the locating routine:~~ An exemplary routine for performing location will be described:

1. A security button 1 ~~e.g. as~~, shown in Figure 1 is pushed. This activates an emergency call routine. The emergency routine comprises the following steps, which are partially optional:

2. In case the mobile is switched off it may activate the mobile device. ~~In case or as soon as~~ When the mobile is switched on, a module for broadcasting over the emergency network, that may operate on frequencies distinct from those of the cellular communication network, is activated. This activation can be done

optionally ~~also~~ regardless of the possibility to establish a connection to a cellular communication network. By activating the module for ~~broadcasting~~broadcasting, an immediate enabling can be ~~understood~~achieved or the starting of a countdown period may be activated after which the module is enabled. ~~Said~~The module ~~is~~may also be referred to as an ELT module, and the respective activator as ELT activator. The ELT module is off during normal operation ~~e.g.~~ in order to reduce power consumption.

3. ~~Now~~Upon activation a distinction ~~has to be~~is made whether a connection to a cellular communications network is available or not:

a) A cellular communications network is available: In case there is ~~a~~ ~~contact~~available communication to a cellular network, the activating of the emergency call routine initiates a speech connection, which is established via the cellular communications network to a safety control ~~centre~~center. A further identification and ~~localisation~~localization of the caller is done via the speech connection (descriptions of the user) or automatic methods of the cellular network, such as using the cell identifier or E-OTD. ~~Additionally~~Additionally, a predefined routine may be started for providing additional optimal help, i.e. e.g. using ~~localisation~~localization methods of the emergency network.

b) No cellular communications network is available: Without ~~a~~ ~~contact~~available connection to a cellular communications network ~~contact~~, an emergency procedure via the emergency network, ~~e.g.~~e.g., a ELT distress signal is automatically activated. ~~Then the~~The safety cell phone then broadcasts an ELT signal. This signal will be received by an emergency network, e.g. an airborne ~~network~~network, and it is attempted to connect to a safety control ~~centre~~center or the receiving station will inform the safety control ~~centre~~center and/or rescue and help services.

4. ~~Hence in~~In both cases, the transmitter of the emergency signal or the user of the communication device can be located accurately via radio and/or cellular communications network bearing. The safety control ~~centre~~center will take further actions in the field of emergency or distress phases. Safety control ~~centre~~center will

then coordinate other service suppliers, e.g. an automobile association a fire brigade.

~~To recapitulate~~In sum, the choice exists to locate distressed persons via a cellular network, e.g. GSM, and/or ELT signals from a cell phone. Furthermore, a voice connection can be established via GSM if a GSM network any other cellular network is available. A safety control centre (SCC) is foreseen to coordinate optimal help.

A preferred embodiment of an apparatus allowing above described procedures of making an emergency call comprises typically a safety or security button 1, which by being pushed activates the emergency call routine. Furthermore, it comprises an ELT module which allows to transmit and/or transpond emergency signals. It also comprises optionally an ELT activator, that activates the ELT module, as already described above. It may further comprise an additional power supply for the ELT module. For aeroplanes, as already described, the ELT activator reacts somehow on gravitational forces. In the framework of the invention, however, the ELT activator can be also ~~realised~~realized differently, which will be explained below. An additional power supply allows longer operation of the ELT module. An automatic communication set-up helps during the establishment of a speech connection. A programmable automatic log-on mode allows accessing the emergency call routine even if the user is not in position to do so manually. Preferably, the body of the communication device~~, e.g. the cell phone~~ is shock resistant. Also, an emergency amplification of the GSM signal can be ~~foreseen~~implemented.

~~Now~~Next, another exemplary embodiment of the above-mentioned emergency routine will be described in further details. As ~~already said,~~previously discussed, by pushing the safety button 1 an emergency routine is started within the cell ~~phone: therefore, first~~phone. Accordingly, an ELT activity countdown is started within the cell phone, regardless of any network connection. After the ELT activity countdown the ELT module is ~~enabled. Then, it has to be differentiated~~enabled, a differentiation is made between a situation ~~with~~where a cellular communications network ~~contact~~is contacted and a situation ~~without~~where

a cellular communications network ~~contact~~cannot be contacted. In case a contact to a cellular communications network can be established, pushing the safety button 1 means, that the safety control ~~centre~~center (SCC) is being rung by the cell phone. The caller can report a distress and provide further details if he is able to and it is possible. The safety control ~~centre~~center tries to identify the caller, the nature of the problem and may retrieve possible medical data of the caller, if the caller is in position to speak. Furthermore, the safety control ~~centre~~center tries to determine geographical coordinates, e.g. via voice and/or cellular communication network data. Within a cellular ~~network~~network, various methods for locating ~~are known, e.g.~~may be used, such as the above-mentioned E-OTD method. As the spatial resolution of ~~localisation~~localization methods within a cellular communications network is limited, it is decided by the safety control ~~centre~~center, whether ELT search is necessary to achieve an enhanced ~~localisation~~localization. Having made this decision, the safety control ~~centre~~center transmits an ELT activation or deactivation code to the cell phone.

In the case without any cellular communications network ~~contact~~contact, an automatic activation of the ELT distress ~~signal~~signal, is performed. Upon this distress signal emergency procedures are being ~~organised~~organized by the SCC, ~~example~~such as giving ~~alarming~~alarm to the police, the fire brigade, ambulance, air rescue, etc. Furthermore, the safety control ~~centre~~center submits location data to search and rescue forces with a link to the activated ELT signal or by supporting then without ELT guidance. An emergency assistance operator may confirm the completion of an operation to the safety control ~~centre~~center.

In a further ~~embodiment it is foreseen that~~embodiment, the safety cell phone can be activated remotely in order to search for missing persons, children or cars. To prevent unwanted use of this method this ~~modus~~mode of remote activation ~~has to~~should be enabled by the user of the cell phone. Also, an automatic check or a safety centre search signal in predetermined time interval may ~~be foreseen~~also be used, even if the power of the cell phone is switched off.

The various embodiments of the invention exhibit major advantages for a safety cell phone concept. The ELT modules, which are to be integrated, are

~~customary~~used in air or vessel traffic. They can broadcast ELT signals in predefined emergency frequencies. The technology within the cell phone ~~has to be~~is adapted and an integration of the safety feature in a standard cell phone housing is possible.

The above-mentioned safety control centre may offer a 24 hour service around the year, voice communication in most common languages of the respective area, a direct interface to emergency operators and cellular network providers, and the access to personal or health data of any cell phone owner. The safety control centre may be a public or private body, which is to be financed accordingly.

In Figure 2 a schematic drawing between users, network providers (carriers) and safety instances are shown: the end user will purchase a cell phone with contract by a supplier 7. The end user 2 may access air traffic control (ELT) 4 via his/her ELT module. Furthermore, the end user 2 can reach emergency instances 5 such as police, fire department, etc. via an emergency number, e.g. 911. The end user 2 can have a normal cellular communications network connection provided by the carrier 2 of the respective cellular communications network. The carrier 2 ~~himself~~ provides data about ~~localisation~~localization run by e.g. EOTD to the security instance 5 such as police or the fire brigade, etc. This information transfer is mainly limited by legislation. The security instance 5, which may be part of the safety control centre 6, have an agreement with the air traffic control 4 , thus they can also access the far more exact ELT ~~localisation~~localization data.

In Figure 3 an extension of this diagram is ~~shown if~~shown, where the safety control ~~centre~~center 6 is sponsored by private and public sectors. The end user 2 himself ~~can as before~~may purchase a cell phone by a cell phone supplier 7 and have a contract with a cellular network provider, a carrier 3. Additionally, the end user 2 can have a certain safety contract with a safety service supplier 8, e.g. SOS, emergency assistance, an automobile association or an armed response. This safety service supplier 8 may be affiliated in some way to the service control ~~centre~~center 6 and be in contact with the security instance 5, e.g. police or fire brigade, or also special users and customers such as an automobile association. The safety control ~~centre~~center 6 has again a connection to the air traffic control 4 and the network

provider 3. The air traffic control 4 may be regulated by the administration of a respective area.

The above described description and drawings are only to be considered illustrative of exemplary embodiments, which achieve the features and advantages of the invention. Modifications and substitutions to specific process conditions and structures can be made without departing from the spirit and scope of the invention. Accordingly, the invention is not be considered as being limited by the foregoing description and drawings, but is only limited by the scope of the appended claims.

ABSTRACT

A system and method for locating a communication device is disclosed, ~~whereby~~ where an emergency call routine is activated~~, by which the following steps are performed. Detecting which~~. The routine detects whether at least one communications network is existent at the location of the communication device. In case that more than one communications network is existent, determining a priority of the communications networks is performed. In case ~~the~~ only one network is existent ~~assigning the~~, a highest priority is assigned to this network. ~~Sending~~ Consequently, an emergency signal is transmitted over the network with the highest priority.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of claims:

Claims 1-11 (canceled).

Claim 12 (new): A method for locating a communication device, whereby an emergency call routine is activated, comprising the steps of:

detecting at least one available communications network at the location of the communication device;

selecting one of the communications networks when more than one communications network is detected;

sending an emergency signal over the selected network;

identifying the communication device; and

localizing the identified communication device by using a localization method available over the selected network.

Claim 13 (new): The method according to claim 12, wherein at least one of the communications network comprises mobile transceiver or transponder stations, by which the emergency signal from the communication device is further transmitted or that function as a transponder for said emergency signal.

Claim 14 (new): The method according to claim 12, whereby a further network is a cellular network.

Claim 15 (new): The method according to claim 12, whereby the emergency cell routine also comprises the identification of the communication device.

Claim 16 (new): The method according to claim 12, whereby also a speech connection is established over one of the detected communications networks.

Claim 17 (new): The method according to claim 12, whereby the emergency call routine can be activated remotely.